

load from the UNIVAC.

Back in those pioneer days, my own work was always influenced by the stark fact that memory was limited and precious and had to be reused as soon as it was no longer needed. My programs were always compact and quick-running, and I usually produced one or two pages of output, rather than the hundreds that now seem to be in vogue—at least in reactor work.

My time of innovation is long past, and I recognize that today's programmable hand-held calculators are more powerful than the large computers on which we worked so long ago.

BERNARD I. SPINRAD

(bspinrad@aol.com)

Lake Forest Park, Washington

Peer Instruction Not Peerless; Students Should Memorize More

As noted in Robert Hilborn's review in *PHYSICS TODAY* (April, page 68) of Eric Mazur's *Peer Instruction: A User's Manual*, Mazur was so dismayed by the poor performance of his students on conceptual physics questions that he developed a teaching strategy called peer instruction to redress the problem.

Mazur raises a good point. As teachers, should we put more effort into teaching concepts? If so, what fraction of our effort should be involved? On the other hand, what fraction of our effort should go into problem solving, math remediation or any number of other things?

It is true that most first-year physics courses do not emphasize conceptual issues. Many instructors teach and test almost exclusively using numerical problem sets. But peer instruction may be just one of any number of ways to teach concepts. Even old-fashioned lecturing might work.

I have some problems with peer instruction. My own classroom experience has been that students sometimes convince one another of erroneous points of view, and some students may be led to think that truth is something decided by majority vote. (I do describe postmodernism to my students, but only to explain that it is unsound.)

I want experiments to tell students what is true. And if students start getting crucial concepts wrong, the best response is to run an appropriate classroom demonstration, not a class discussion.

My students also need to memo-

rize more, not less. Some students entering my college physics class don't know the area of a circle or that volume is length times width times depth. I expect them to learn the formulas for Newton's second law, kinetic energy, momentum, etc.

ROBERT JONES

(jonesrob@esumail.emporia.edu)

Emporia State University
Emporia, Kansas

Did Landau Work—or Not Work—on the Soviet H-Bomb?

I read with interest the articles by German Goncharov in your special issue, "New Light on Early Soviet Bomb Secrets" (November 1996). However, I am left wondering at the extent to which the Soviet Union's leading theoretical physicist, Lev Davidovich Landau, was involved. He is mentioned only in passing by Goncharov, and others have also regarded him as a minor figure in the H-bomb program. Yet, in the three years leading up to the first Soviet detonation, in 1953 (the year in which he was also awarded the title Hero of Socialist Labor), he was at the height of his powers but published no papers.

If he did not work on the H-bomb program, why did this prolific physicist fall silent for three years, and how did he persuade the Kremlin to grant its best scientist exemption from doing vital work for the state? If he did work on it, why is this not more widely known, and what was the nature of his contribution?

ANTHONY GARRETT

(scitext@c2.org)

Granchester, Cambridgeshire, England

(EDITOR'S NOTE: See Gennady Gorelik's letter to the editor in *PHYSICS TODAY*, May 1995, page 11.)

Unorthodox Parallel Revealed between Sarov and Los Alamos

As the golden domes of the pre-revolutionary Sarov skyline suggest (*PHYSICS TODAY*, November 1996, page 27), the Soviet "Los Alamos" had an earlier incarnation as one of the chief centers of Russian Orthodoxy. In the 19th century, Sarov was associated particularly with the "hesychastic renewal," a religious movement vividly depicted in book 6 of Dostoyevsky's novel *The Brothers*

Karamazov. Sarov's most famous hesychast was the forest hermit St. Seraphim,¹ an apostle of nonviolence whose radiant personality, friendship with animals and mystical vision of a cosmos pervaded by love have led many to term him the "St. Francis of the East." The building of the Soviet Union's atomic bomb in the vicinity of St. Seraphim's wood thus has something of the same grotesquerie as the building of America's near the Sangre de Cristo Mountains.

References

1. *St. Seraphim of Sarov: Selected Works*, Little Russian Philokalia, vol. 1, Saint Herman of Alaska Brotherhood, Platina, Calif. (1988). N. A. Motovilov, *A Wonderful Revelation to the World*, Saint Nectarios Press, Seattle (1985).

NORMAN HUGH REDINGTON

KAREN RAE KECK

(redingt@mit.edu)

Massachusetts Institute of Technology
Cambridge, Massachusetts

Ranking the Physics Departments—and the Weighting Game

I would like to comment on the critical issue of how best to rate physics departments, which was last discussed in your pages in October 1996 ("Letters," page 15) when John Perdew and Frank Tipler raised some valid concerns about ranking such departments.

Their findings show that the average faculty quality (as they measure it) is high at departments that are not normally highly rated. I think that there is a very good explanation for this. With the job crunch in academia in the past two decades, most departments have been able to hire faculty of the quality that they would not have dreamed about hiring in the past. There are outstanding faculty in most physics departments, and that is a point that needs to be recognized by students, deans, granting agencies, etc.

I have two general reservations about Perdew and Tipler's suggested ranking scheme. First, they are substituting one arbitrary measure for another. It is true that citations per faculty member is at least a numerical measure (as opposed to general impressions about department reputations). However, some subfields of physics tend to have more papers than others (and therefore more citations), and there are reasons other than high quality for citing a paper—for example, to criticize it or because